THE QUARTERLY MAGAZINE OF THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY
VOL. 10/NO. 2 FALL 1971

Terra

A negrito mask by Victoriano Salgado is danced in the danza de los niños by a six year old boy.

A band plays traditional Tarascan pirecuas in the fiesta.

Seated atop a flat bed truck, this royal court of children waves to the crowd.

Miyatake at Manzanar

The photographic exhibition, Manzanar: Story of a Concentration Camp, opened October 5 and will close March 15, 1972. Manzanar was the camp between Lone Pine and Independence, ten miles north of Mt. Whitney, in which over 10,000 Japanese-Americans were interned from the spring of 1942 to the end of 1945. Then, Manzanar was the largest city in Inyo County; now, only some broken shells of buildings remain, the best of which houses some county construction equipment. During this unhappy episode, one of the Japanese-Americans interned was Toyo Miyatake, a photographer who hid a lens in his pocket to pass the camp guards forbidding photographic equipment, and constructed the rest of his camera from materials at hand. More than half the photographs in the Museum exhibition are Mr. Miyatake's. Now 76 years old, Toyo Miyatake still has a Los Angeles studio in which three generations of his family are currently working.

Get Behind the Scenes: Open House

Mark your new calendars now for the annual Museum Open House, on Friday evening, February 4, 1972, from 6:30 to 10. This very popular event offers all Museum Alliance members and their families a once-a-year opportunity to get behind the scenes in areas of the Museum not open to general view, An Open House highlight is the chance to meet and talk with the curators of each department, who always look forward to greeting the Museum members. Reservations for this event are necessary, so watch for the special announcement to be mailed to all Alliance members.

Indian Rug Show and Sale

Watch for the ten days' exhibition of Indian rugs and weaving, February 3-13, 1972. Over five hundred Indian rugs will be offered for sale, from modest to prouder prices. They may be purchased during the exhibit. Every day a Navajo weaver will demonstrate rug weaving techniques, the same used to create the hundreds of exquisite and often old rugs from the Indian Southwest. Some rugs are offered from private collections; some from dealers; all are fine. There are two "Gray Hills" rugs, the famous natural yarn gray-brown-blue pattern from the Gray Hills Trading Post in the Navajo Reservation. There are old chiefs' blankets. There are Germantown rugs, a type made from unravelled Germantown shirts and rewoven. There are Yei and Yeibichai patterns. It is a priceless exhibition, priced for you and other rug buffs, or simply to be seen for productive pleasure.

Digging the Dig: Depth and Breadth at La Brea

Science and education are having a field day at the Rancho LaBrea Project, and the public are not far behind in enthusiasm. More than 900,000 have visited, 1,623 volunteers have contributed 46,700 hours, and on-site donations through the sabre-toothed "kitty" and souvenir sales have reached $9,900. Recovered specimens now total 790,000 — more than 88,000 per foot! Explaining LaBrea's great fascination for scientists here and in other countries, Dr. Neil Maloney, one of the project's geologists, says, "We have a unique opportunity of studying the sediments laid down during an offlap of the ocean at a site that is rich in fossils." Dozens of scientific papers about the dig are in preparation, including one describing new techniques developed for recovering specimens.

Join the Museum Services Council

Come pick a bone with us at Hancock Park, or dig one up, or lead tours of the dig. Maybe you would rather help bring new memberships to our Museum Alliance, or work with our new bookstore plans. There is much interesting and challenging volunteer work to be done at our Museum. Offer your time and talent by joining the Services Council of the Natural History Museum Alliance. For information, call Fran Kellough, 749-3583.

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The Quarterly magazine of
THE NATURAL
HISTORY MUSEUM
of Los Angeles County
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The Compleat FIESTA

by **Janet Esser Weiner**

The Mexican fiesta is a complex expression of community values. Its semi-ritualistic form permits the acting out of shared traditions, beliefs and ideals. Produced by the community, it reaffirms the community's sense of well-being and presents, in visible, tangible form, for all others to see, its sense of union and solidarity. It was my good fortune to have spent the summer of 1970 in Uruapan, Mexico, investigating the role of the mask in a Mexican community. It was possible to observe and participate in a fiesta from its earliest preparations through its happy conclusion and aftermath.

The city of Uruapan is located in the state of Michoacan whose boundaries represent fairly accurately the territorial extent of the ancient pre-Columbian Tarascan "Empire." Located some fifty kilometers from Lake Patzcuaro, the proverbial homeland of that group which rivaled, in power and influence, their contemporaries, the Mexicas, or as they are better known, the Aztecs, Uruapan lies at 5,500 feet above sea level and has a population of about 100,000. In typical Mexican fashion the city is subdivided into a number of *barrios* which are roughly comparable to our system of wards, but which, perhaps, demonstrates a greater sense of social or community cohesiveness. Each *barrio* has a patron saint whose name it adopts and whose day it observes with a fiesta. The fiesta described below takes place every year on July 22 and 23 in the *barrio de la Magdalena,* its date determined by the Church Calendar.

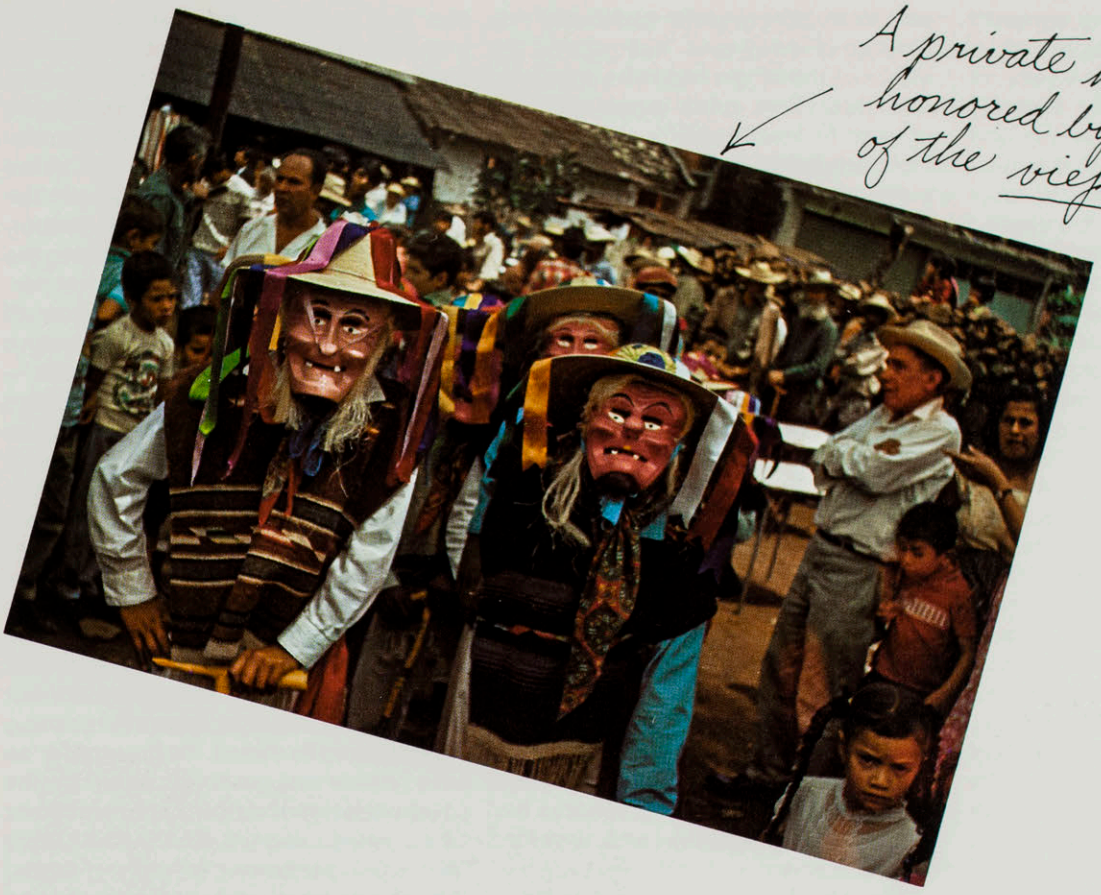
Since each *barrio* has a patron saint and each saint has its own day, the date on which the fiesta will be held is the actual saint's day as recorded in Church history. The fiesta does not purport to commemorate the saint, in particular, but, rather, the existence of the entire community which is bonded together by, among other cohesive factors, the patronage of the saint. With reference to the commemorative function of the fiesta it is illuminating that in the *barrio de la Magdalena,* although the name of the saint was often spelled out, the Magdalene was not represented except within the small, local church, and even there, it was the statue of the Virgin which held the place of preeminence.

The fiesta is held for two days, the first being ostensibly religious in nature and the second, secular. Both, although

Intricate decorations of wax and fresh gladioli adorn the altar for the misa.

Los viejitos, in mufti pose for a group portrait after a practice session.

Music is provided for the dance of the viejitos on a borrowed violin and a home-made guitar.



A private home is honored by a performance of the viejitos.

Ramon, fourteen year old son of maskmaker Marcelino Baez, leads the dance of the viejitos.

During the parade the dance is performed several times, the dancers elevated on the bed of a truck.

this may not be immediately apparent to the casual observer, are highly structured with traditional sequences of events and role playing. The first day is devoted to religious services and the second to the parade. More explicitly, on the first day the *barrio* turns inward, upon itself, and on the second displays its sense of solidarity to the city at large. Both days serve to reaffirm this sense of community. Religious and secular aspects cannot be easily distinguished, however, since there is much overlapping of elements — all serving to underlie the basic theme of identification. The "we" are being delineated from the "other."

At four in the morning the sleeping city is awakened by the loud reports of skyrockets, signalling the beginning of the fiesta. These explosions may continue for as long as half an hour at more or less regular intervals. In actual practice, the formal observances of the fiesta commence in the early evening preceding the first day with the arrival of the musicians who ceremonially salute each of their *cargueros* before assembling for supper, the first of the several meals which will be provided for them both as part of their pay and as occasions for formal feasting. The afternoons are reserved for gatherings based on the bonds of family and friendship. It is then that feasting, drinking, and dancing take place. Activities devoted to adolescence and courtship are presented on the evening of the first day with sponsorship of community dancing to the accompaniment of local combos or record players. These are of the type familiar everywhere in the Western world.

On the first, or religious day, of the fiesta of 1970, four services were held in the local church, or *capilla,* the start of each one announced by the firing of additional rockets from the portico of the religious school directly opposite. In addition, the worshippers were summoned by the sonorous tolling of the church bell located, not in the belfry, which the chapel lacks, but in the church courtyard. The function of beadle was performed by sisters of the local religious order who also are in charge of the school. Although the *barrio* also has a larger church, the *templo,* where the priest has his living and counseling quarters, it is the *capilla* which is the real center of *barrio* religious life. The most important service of the day was the *misa* which began at ten in the morning and lasted for one hour. The *capilla* had been previously cleaned and decorated. The statue of the Virgin had been repainted and dressed in a new gown; garlands of fresh fir needles festooned the nave; the portal had been outlined with an elaborate construction of pine boughs, maguey leaves, and cut flowers; and the altar was adorned with intricate decorations of wax. Chairs had been arranged along the aisles for the first communicants and *mariachis* had been hired to play and sing for this service which was partially conducted in the vernacular. Outside, in the courtyard, the dancers were assembled with their sponsors. They did not enter the church until the *misa* was over. Then, amid incredible shoving and pushing, in they went to perform the entire masquerade in the small transept. (Although no benediction was bestowed on this performance, and it was not part of the church service, it was thought by the masquers to be an act of consecration.) Outside the walls of the churchyard the kermis had been spread. Since at least eight in the morning vendors had assembled, preparing and hawking food and toys.

The traditional fiesta is composed of various *cargos* — literally, burdens. The making of masks, preparation of the kermis, the teaching of dance steps, refurbishing the statue of the Virgin, the hiring of bands of musicians — all of these and many, many more are *cargos.* Each *cargo* has one or more individuals serving as sponsor or *carguero.* A *carguero* may also have several *cargos.* The business of deciding upon individual sponsorship is usually attended to in a fairly informal manner. There exists no central steering committee; during the course of a fiesta most responsibilities for the next year's undertakings will have been assumed on a voluntary basis. Suffused with the positive mood generated by the *ambiente* of a fiesta one individual may ask two friends to share a burden with him. His knowledge of these friends is accurate and he is rarely refused. Many *cargos* are traditional, the same person undertaking them year after year with perhaps different *co-cargueros.* It sometimes occurs that a person feels strongly that he must take on a burden, thereby displacing a traditional *carguero,* but such behavior is exceptional and does not always have happy results as shall be demonstrated.

About one month before the date of the fiesta the *cargueros* visit the priest of the *barrio* to inform him of their intentions. This is a ceremonial gesture since the priest has no say on the structuring of the fiesta although he may hold some strong opinions. Gabriel Solórzano, the local curate, was of the opinion that many of the *cargos* in the *barrio* were undertaken out of superstition, in the belief that by so doing the individual could gain favor with a particular saint and that in the case of some persons this involved serious threats to their economic existences — so enormous were the financial outlays in proportion to their incomes. He also felt, however, that the form of the fiesta offered a unique expression of unity and cooperation.

Marcelino Baez was the *carguero* in the summer of 1970 of the Dance of the Little Old Men *(los viejitos).* This year they were to be *tiny* little old men (*viejecitos*). Baez had undertaken this *cargo* for many years in the past but not during the two years preceding last summer's fiesta. During that time the dance was not included in the festivities for want of a sponsor. Baez had instead undertaken the *hortelanos* (literally: gardeners; actually, a ragtag masquerade), perhaps because, as one of his associates suggested, the work and money expenditure was less. As *carguero* of the *viejecitos,* Baez' responsibilities included the carving and painting of twelve masks and canes; the selection and rehearsing of the twelve dancers; the playing of the violin during the rehearsals and the many performances of the masquerade on the two days of the fiesta; the procuring of the services of an accompanist; and the provision of breakfast for the dancers on the morning of the first day. Other than the mask and cane, the costume of each dancer was the responsibility of his parents. The dancers varied in age from seven to thirteen and were grouped in two lines, each one paired with his opposite number as to height. Practice sessions took place in the courtyard of the maestro's compound. The choreography of the dance was already well known to the boys and no verbal instruction was necessary. (In addition to observation, very small children are actually moved bodily through the steps by adults, so that the learning process is kinesthetic as well as visual and aural.) Dance figures were rather complicated — resembling our Virginia Reel but with many small steps and lateral movements. Children performed

the dance with consummate skill and when, during the fiesta, they were dressed in the traditional costume of beribboned hat, serape, and embroidered *calzones,* the result was highly effective. The mask of the *viejito* represents the wrinkled visage of an elder, crazily senile, and startlingly hypnotic in impact. This last quality is greatly enhanced by the stylized head gestures made by the dancers. Beside the many practice sessions, the children performed the dance at least twenty times on each of the two days of the fiesta. In addition to the performances in the church and the parade, the presentation of the masquerade in the homes of friends of the *carguero's* and of each child's parents is considered an honor and an obligation.

Other children were involved in the fiesta, too. A rather large and amiable woman, but very poor, had moved to the *barrio* from a nearby village some three years earlier. She had undertaken the *cargo* of the Dance of the Children, which also involved the hiring and housing of a band of musicians. Since this woman was considered to be an outsider, her sponsorship was not regarded kindly and her innovations were looked upon with suspicion. Even the priest was critical because she had gone into debt for the next two years. The woman who usually undertook the obligation of the dance was especially critical. Because of local opposition the new *carguera* was forced to bring additional children from her home village to participate. Three weeks before the fiesta she conferred with a local mask-maker on the plans for a float *(carro-alegorico)* which he constructed on the morning of the second day over the body of a borrowed truck. On the first day the children danced and on the second, rode in the parade. Girls were dressed in white with rose velvet capes and shiny tiaras; all fashioned by their mothers, while boys wore school uniforms of a quasi-military style. The *carguera* never changed from her work-a-day costume of blouse, skirt and worn apron, as she accompanied the children on their rounds of dances or walked beside the truck throughout the duration of the parade. Children were arranged on the bed of the truck in a tableau which included a king, a queen, the Virgin and an angel. This annoyed some of the long-time residents of the *barrio* who said, "Here we have no kings and queens — here we are all equal."

The *niños* were protected ceremonially by four masquers dressed as *negritos.* These are fabulous beings who serve to keep the crowds from pressing too close to their charges. They have their own traditional dance and music which they performed once on the morning of the first day. They wear black masks painted in an ancient American Indian technique known as *laca* which uses a non-resinous wax, *aje,* made by boiling immature scale insects. The masks have large, aquiline noses, blowing or twisted mouths, forked beards, and headdresses made of black sheepskin which are attached to the mask with many colored ribbons and gold framed mirrors. Shirt, vest, chaps and trousers of Spanish Colonial *vaquero* style, complete the costume. A braided leather whip is carried in one hand and used to menace those — especially young children — who come too close.

There were three bands of musicians in the fiesta and each band came from a different village. This interchange is customary throughout the Tarascan area and, perhaps, of ancient origin. Motivations for this practice may be several: People in a *barrio* wish to participate in their own fiesta rather than being restricted to the band. In addition a *carguero* enhances his prestige by paying a lot of money to hire a band from elsewhere. The custom has the advantage of preventing internecine violence because one does not get as angry with a band which has come from elsewhere and to whom one is paying money. A musician playing in his own town is known to everyone and so there is not the feeling that something special is going on. Thus the hiring of outsiders makes for a more aesthetic structure. Then, too, there is also the heightened sense of social interchange; it is more fun for the visiting musicians — they, also, are away from their usual surroundings. Each band tries to augment its reputation and musical competitions are held during the afternoons of the fiesta days. This opportunity would be lacking if all were from the same town.

In the afternoons of both fiesta days large dinners are held in many homes. Married children return home with their offspring at this time. It is customary for several families to pool efforts, the neighbor women pitching in and all working together in the kitchen to prepare the large feast. Long tables are set up in the interior courtyards of the houses and the serving is continuous, people coming and going all afternoon. A rich meat soup *(churipu)* is served accompanied by platters of small steamed maize dumplings *(kurundas).* Rice, chicken mole, freshly made tortillas, and a cola beverage complete the meal. The musicians play at the homes of their *cargueros* and lively couple dances of the "folk" variety are held in the late afternoon.

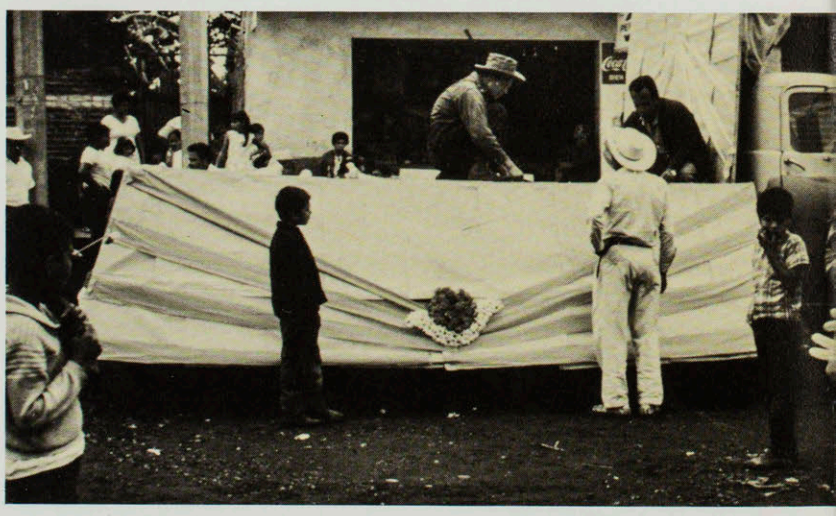
Victoriano Salgado, a respected mask-maker and elder of the *barrio,* had as his customary *cargo,* the construction of the *portada,* or decorated entrance to the church. Although the *portada* is ephemeral, intensive labor is required to build it. The substructure is made of green boughs and saplings, richly ornamented with pine needles, maguey leaves, and flowers inserted so as to spell out the legend, "Santa Maria Magdalena." At nine a.m. on the morning of the day before the fiesta maguey leaves were brought to his house. His working sketch for the design of the *portada* had been completed a week earlier. Each year's design is different from all those preceeding, although the general conformation remains constant. He started to build at eleven a.m. For tools he used rope, a retractable steel measure, hammer and nails, and a machete. He did not consult any drawings or figures while working and although he took many measurements he said he kept the dimensions in his head. It was necessary that the *portada* be of roughly the same dimensions as the entrance to the *capilla.* Construction took place on the dirt road adjacent to his house compound. By two p.m. the substructure was completed. A rainstorm which was to last late into the night had begun at about one and at four p.m. ten men carried the heavy rainsoaked structure to the community center — a distance of some three long blocks. A truck was borrowed to transport the needle-laden pine boughs which had been stacked against the wall of Salgado's compound. The substructure was then tilted against the raised boxing ring in the community center and the boughs of pine were laid in. Almost all of the pine was used and then sewed in with nylon cord. The design was then outlined with this cord to which daisies, maguey leaves and yellow chrysanthemums were attached. Some fifteen to twenty men were engaged in the final stages, and at least four had been on hand since the beginning of the work. Upon

Sra. Aurora Lopez as carguera, organizes the niños for their dance.

Two young ladies of the barrio pose in the traditional finery of the Tarascan meseta for the dance of the canacuas.

Don Victoriano's son as a negrito in a mask and headdress made by his father.

all photos by Janet Esser Weiner



Final touches are added to the carro alegorico by don Victoriano minutes before the parade will start.

Masks of banana leaves, such as this expressive example are often made just prior to the fiesta and are later discarded.

Construction of the portada is a group effort. Friends donate a full days labor to help designer Victoriano Salgado.

Maestro Marcelino instructs the viejitos in front of the completed portada.

An adult negrito oversees the danza de los niños and keeps the crowds from pressing too close.

Colored rice flour sweets are sold in front of the capilla as part of the kermis.

Las canacuas twirl slowly during the parade, bearing covered trays on their heads. Traditionally these were offerings to distinguished visitors and patrones.

Covered with ears of maize, a mayordomo of San Isidro will guide yoked oxen in parade.

Hortelanos leading the parade. On the left, a malinche dressed as a woman, and in the center, an antique mask owned by the masquer's family

completion, at about three in the morning, the *portada* was carried to the *capilla* and set in place.

Many aspects of the fiesta appear to be spontaneious when, in fact, they are highly structured. The *cargo* of the *hortelanos* is a case in point. It is customary in the city of Uruapan to have a group of men arrayed in various disguises lead the parade on the second day of the fiesta. These men play a buffon role, amusing the onlookers while focusing their attention on the parade. They also help to keep the route clear of stragglers. Although the disguises vary from *barrio* to *barrio,* certain stock characters remain constant. There are always a few *malinches* — transvestite characters who have been dressed and made up quite solemnly with the aid of their sisters. The word derives from the name of Cortes' Indian mistress and translator. Also present are *espantapajaros* (scarecrows). These are dressed in tattered clothes, their faces hidden behind an ingenous variety of masks, which range from antique wooden heirlooms to masks made the same morning from half of a volley ball. One young man residing in the *barrio* has begun to make impressive masks of dried banana leaves, and these were used also. Throughout the length of the parade route, the *hortelanos* staged a continuous series of situation comedies, all of them bawdy. And yet these were not like fraternity rush pranks. The participants were unselfconscious and dedicated; they conducted themselves with an air of theatrical presence and dignity.

The parade started at twelve-thirty, as soon as Maestro Salgado had put the final touches on the *carro alegorico.* A written permit to hold the parade had been solicited from the mayor three or four days earlier but, even so, many cars, buses and trucks were encountered on the narrow streets enroute. However, the parade accommodated itself easily to them with no confusion. The float and the flat-bed truck bearing the *viejitos* were alternated with bands of musicians. Many of the people from the *barrio* walked or, rather, strolled, in the parade — there was definitely no marching even though the bands did play some martial cadences along with traditional Tarascan folk melodies. An agricultural theme was represented at the rear of the parade with *canacuas,* men on horseback, boys on mules, and oxen following the third band of musicians. Yoked flower bedecked oxen *(yuntas)* were dedicated to San Isidro, the patron saint of farmers, and were led by a man from whose hat and cummerbund hung many ears of maize. Several men walked along the edges of the parade tossing dried kernels of corn, which they carried in gunny sacks, at the crowd. One man, as he scored a direct hit, cried in English, "fertility."

The *canacuas* is a women's dance and is not, properly speaking, a *cargo.* Any girl or matron who wishes to do so and is able to obtain a costume may enter this dance. The women wear long traditional Tarascan pleated black skirts called *rollos.* These are covered with full length colored aprons of silk or satin, embroidered and lace trimmed. The skirts have no waistband; instead the pleats are formed when the skirt is put on and the top is worn well above the waist, held in place by the strings of the apron. Women wear their hair in long braids into which several colorful ribbons and many bows have been plaited. White embroidered blouses with either drawstring closings or elaborate yokes, covered with many necklaces are worn. Each girl carries a round tray, usually bearing the name of the local beer company, on top of her head, gracefully supported by one raised arm, the other arm slightly lifting her skirt. On the trays are the good things of life, *i.e.,* fruit, bread and cigarettes. This is covered with a delicately embroidered cloth of linen or *cuadrillano* (a kind of huck-weave cotton). Some of the women carry wicker bottle baskets adorned with packages of cigarettes and containing *charanda,* the local brandy, or tequila. Those walking in the parade are proffered drinks from the tiny cordial glasses the women carry. (Walkers — those who do not have a specific function in the parade — keep changing places — falling back or moving ahead — so everyone has a chance to visit and exchange a toast. While there is none of the precise cadence we are accustomed to, somehow a sense of graceful order is maintained.) *Canacuas* have their traditional music and the dance is fairly slow and langorous. They twirl around gracefully while doing a shuffling shaddesh step. After the parade has completed its circuit and is back in the *barrio,* the boys begin to call teasingly to the girls and the girls then toss the contents of their trays to the crowd. The boys ask for specific things such as a pear and then there is a scramble to catch it. Men in the parade begin to toss flowers from their decorated hats at this point. Before the tossing begins, however, each dance is performed one more time.

Perhaps one of the most puzzling aspects which emerged, and one which seemed to intensify the difference between this Mexican fiesta and Northamerican holiday pageants, was the apparent lack of any kind of co-ordinating committee. During the planning stages of the fiesta, business as usual was the rule. Much of the activity was last-minute but none of it was hectic or feverish. Each involved individual seemed sure of his assumed responsibilities and duties were discharged unbeset by either minor crises or major catastrophies. At no time during the two days did there seem to be any kind of communication between the *cargueros.* It is true that groups of adolescent boys seemed to know what was going on at every moment but they did not appear to be communicating this news to the adults. The evidence of the smooth functioning of the celebration would appear to point to the existence of an organizing principle; but this organization, because it is inherent in the life of the community itself, had no need to be institutionalized. When the fiesta was over, I was asked by some of the people in the *barrio* to compare theirs with others I had witnessed in the city. When I replied that in my opinion theirs was best, they agreed. Prior to this admission on the part of an outsider they would not have thought to praise the fiesta as that would have been considered *egoista,* a fault they hold to be most unsavory. Now they said that, yes, their fiesta was superior because, although theirs was not the largest *barrio* in Uruapan, and certainly not the richest, it demonstrated a greater spirit of union — all of them working together for the common good.

The author is an assistant professor in art history at Loyola University — Marymount College, Los Angeles. She undertook a field investigation in Uruapan, Michoacan in the summer of 1970 under the guidance of Dr. Thomas McCorkle, anthropologist. She was in Uruapan winter, 1971 and summer, 1971. Last summer's field study was partially financed by the receipt of a grant from the Institute of World Understanding in La Jolla, California.

medicinal trees

by **Robert Gustafson**

The quest for plants with medicinal properties has been pursued since antiquity. Primitive peoples have recognized the lenitive properties of certain plants and passed these traditions from generation to generation. The sophisticated technology of the 20th century has given the world not only the means to annihilate but also a new hope for survival through the fields of pharmacology and phytochemistry. Quinine from *Cinchona,* chalmoogra oil from *Hydnocarpus,* camptothecin from *Camptotheca* — efficacious in the treatment of malaria, leprosy, and cancer — are all examples of man's debt to plants.

In gardens throughout the world, trees are grown for their ornamental value. Many of these are also important medicinals, an attribute often ignored. Some trees are so frequently encountered that one never considers their merit beyond that of supplying shade or color to a park, garden or thoroughfare. If one were to count the number of camphor, pepper or blue-gum trees growing in southern California, he might be inclined to regard them as a part of the native flora. These arborescent plants have origins and histories as diverse as their appearances, and deserve more attention than as mere elements in landscape architecture.

The camphor tree, *Cinnamomum camphora,* a native of Japan and China, may attain a height of 40 feet and is a widely planted street tree in our metropolitan area. The inconspicuous greenish flowers are borne in small clusters in the spring and are barely noticeable against the shiny evergreen leaves. The small reddish fruits which follow are about the size of a pea. *Cinnamomum* is from the Latin of the same meaning; *camphora* from the Arabic word *kafur* meaning chalk, so named because of the white crystalline nature of the resinous exudate.

Camphor of commerce is extracted from this tree and another unrelated plant, *Drybalanops camphora,* restricted solely to the tropics. Natural camphor occurs as a white crystalline substance with a penetrating odor, cold to the touch and not unlike menthol in that property. It appears in clefts in the wood of stems and roots from whence it is then extracted. The crude material is subjected to a sublimation process and pressed into cakes. Synthetic camphor is manufactured from pinene, one of the constituents of turpentine oil, which is obtained from several species of pine. Although there is still a demand for the natural product on the market, the synthetic is foremost in importance.

When applied externally to the skin, camphor numbs the peripheral sensory nerves and has been employed as a counter-irritant for bronchitis, rheumatism, sprains and numerous inflammatory conditions, as well as possessing some antiseptic properties. Internally it has been used to mollify hysteria, nervous disorders and occasionally in cases of severe diarrhoea. However it is quite toxic in large dosage and must be administered judiciously.

The Mexican coral tree, *Erythrina coralloides,* is a showy ornamental with spiny branches and soft wood. Torch-like terminal racemes of tubular scarlet flowers appear before the leaves. *Erythrina* is from the Greek meaning red, referring to the color of the flowers; *coralloides* from the Latin designating coral-like.

This plant and related species are used by the Indians of Mexico and Central America in a variety of ways. Roots have been employed to induce sweating, their sudorific attributes, however, seem open to question. Stems and bark have toxic properties and are used to stupify fish. The bark yields a potent alkaloid, erythrine, which is capable of producing a pronounced effect upon the central nervous system while the juice from the stem is an anodyne for scorpion stings. In some areas small doses of the bark are utilized as a hypnotic, a purgative and a diuretic. Leaves are reputed to be an effective agent in promoting menstrual discharges. Decoctions of the flowers are supposedly helpful in treatment of chest infections while the blossoms themselves are often cooked and eaten as a vegetable or in salads. The highly poisonous red-orange seeds are the source of a potent hallucinogen, a property well documented throughout much of Mexico. An extract from the seeds has been suggested as a substitute for curare.

The blue-gum, *Eucalyptus globulus,* is the most prolific of the introduced trees in California. This towering giant of the Australian forests is characterized by its deciduous bark which peels away in long, thin strips leaving the exposed trunk smooth and white. It bears long sickle-shaped leaves and white flowers about 1½ inches in diameter. The fruit is covered with a bluish "bloom" whence it derives its common appellation. *Eucalyptus* is from the Greek meaning well-covered, designating the cap covering the unopened flowers; *globulus* from the Latin referring to the form of the fruit, closely resembling a kind of button worn in France during the 19th century.

The advent of the blue-gum into California, Europe, Africa and South America is due to a 19th century German botanist and explorer, Baron Ferdinand von Muller, who suggested the use of *Eucalyptus* "vapor" as a disinfectant in areas where malaria was prevalent. Trottier, a French botanist of the same period, discovered that the roots of the tree had a powerful drying action on the soil, especially in marshy districts. The tree is now widely disseminated in the once malarial regions of Italy, Sicily and Algeria. Its distribution worldwide is ubiquitous.

Eucalyptus oil is expressed from an aqueous distillation of fresh leaves. It has been engaged as a stimulant, an antiseptic gargle, to increase cardiac action, and occasionally internally in specified dosage for pulmonary tuberculosis. When equal parts of the oil and powdered gum-arabic are mixed in water, the resulting emulsion has been used as an urethral injection. Eucalyptus-chloroform was formally administered as a remedy for hookworm in tropical countries but its use is now archaic since more effective vermifuges are available. The oil often appears as an ingredient in certain ointments which assuage irritations of the skin. Several other species of *Eucalyptus* yield essential oils, three classes of which are commercially important. In addition to medicinal properties, the oils are employed as scents in perfumes and soaps as well as industrially in the extraction of metallic sulphides from ores.

The flowering ash, *Fraxinus ornus,* is a small deciduous tree native to the Mediterranean region. Although its presence in Southern California is somewhat limited, it deserves more attention since it is most attractive when in flower. The dense terminal sprays of whitish flowers appear in late spring in contrast to the large pinnate leaves. *Fraxinus* is from the Greek meaning to fence-in and refers to the use of the plants as hedges or fences; *ornus,* from the Latin designating wild mountain ash.

The sugary sap exuded from the bark is known as manna. Most of the manna of commerce comes from Sicily where the tree is extensively cultivated. It is not harvested until the trunk of the

Cinnamomum camphora —
Laurel family

Punica granatum —
Pomegranate family

Eucalyptus globulus —
Myrtle family

Erythrina coralloides —
Pea family

Fraxinus ornus —
Olive family

Ricinus communis —
Milkweed family

Melaleuca leucadendron —
Myrtle family

Robinia pseudoacacia —
Pea family

Laurus nobilis —
Laurel family

tree is at least 3 inches in diameter whereupon incisions are made into the bark. The large pieces known as flake manna are collected in early autumn when the heat of summer has begun to lapse. Strips 2 to 3 inches long, iregular in contour, pale yellow to white in hue, are then put on the market. Another less desirable grade of manna is also collected and is known as "gerace." It is less crystalline in appearance, more viscid and dark brown in color.

The principle constituent of manna, mannite, is a white crystalline powder, odorless and sweet to the taste. Mannitol, an alcohol derived from the crude material, has been used as a diagnostic agent in kidney function tests and as a diabetic food since it forms no glucose in the blood. Manna has also been employed to mask the taste of certain bitter purgatives while at the same time adding to the emetic properties.

Prior to the 15th century manna was unknown. Although we find references to it in the Old Testament, that substance does not refer to the product as it is known today. The Manna of Scripture is still disputed and has been designated either as an edible lichen, the exudate from *Tamarisk* shrubs, the excretion from the bodies of certain coccid insects or possibly the fruit of the carob tree.

The laurel or sweet bay, *Laurus nobilis,* is an evergreen tree often reaching a height of 50 feet, depending upon climatic conditions. Small clusters of chartreuse flowers are borne in the spring, almost hidden by the rigid aromatic leaves. *Laurus* is the Latin word by which the Romans denoted this plant; *nobilis* from the Latin meaning highborn or exalted, since wreaths of the leaves crowned the heroes of antiquity.

The laurel has figured prominently as a token of highest esteem in music, poetry, sculpture and athletics. The Delphic priestesses were said to have used the leaves to induce visions and oracular power. In Greek mythology, the nymph Daphne, pursued by Apollo, prayed to Athena in her flight and that goddess subsequently transformed her into a laurel tree. In Europe *Laurus* is known by the name of Daphne.

The sweet bay is best known as a condiment but it has on occasion found its way into medical practice. The berries and leaves are purported to be an excitant, the latter having been used to induce sweating, reduce hysteria, relieve flatulance, induce menstruation and in large doses to cure constipation. The berries have been taken to promote abortion, remove abdominal obstruction and to stimulate appetite. Oil of bay is still used as an external application for sprains and bruises. The California laurel, *Umbellularia californica,* is a closely related plant and has been used by the Indians in much the same manner as its European counterpart.

The Cajuput or white tea tree, *Melaleuca leucadendron,* is another common street tree in California. It is indigenous to the East Indies and tropical Australia and characterized by pale spongy bark which is shed in large papery flakes. The white flowers are borne on spikes closely resembling a bottlebrush. The leaves are highly aromatic when crushed. *Melaleuca* is from the Greek words, *melas,* white, and *leucas,* black, apparently designating the appearance of the bark after a fire; *leucadendron* also from the Greek meaning white-tree.

Cajuput oil is distilled from fresh leaves and twigs and has a redolence not unlike that of camphor or rosemary. It is acrid to the taste and highly volatile, burning without a residue. The pale greenish tint of the oil is an indication of the presence of copper.

Medicinal uses are varied, namely as an antiseptic, stimulant, diaphoretic, anthelmintic, and antispasmodic. When taken internally it induces a sensation of warmth and generally produces profuse sweating. In cases of chronic laryngitis and bronchitis it is a stimulating expectorant; in bladder inflammation, an antiseptic; in roundworm infestation, a vermifuge; in flatulance, a carminative; and in psoriasis and other skin infections, a counter-irritant. Blossoms of the cajuput are much loved by bees, but the honey obtained is inferior in quality because of its disagreeable odor and taste.

The pomegranate, *Punica granatum,* is more frequently encountered in this area as a large shrub, but in its native habitat in western Asia and the Mediterranean, it is a small tree to 15 feet with deciduous leaves and intense orange-red flowers with crinkly petals. The pulpy fruit is a large thick-skinned berry about the size of an orange embedded with a multiplicity of seeds. Several varietal forms are found in cultivation. *Punica* is from the Carthaginian word, *punicus,* referring to that ancient land; *granatum* from the Latin meaning many-seeded. The Romans called this plant "Apple of Carthage."

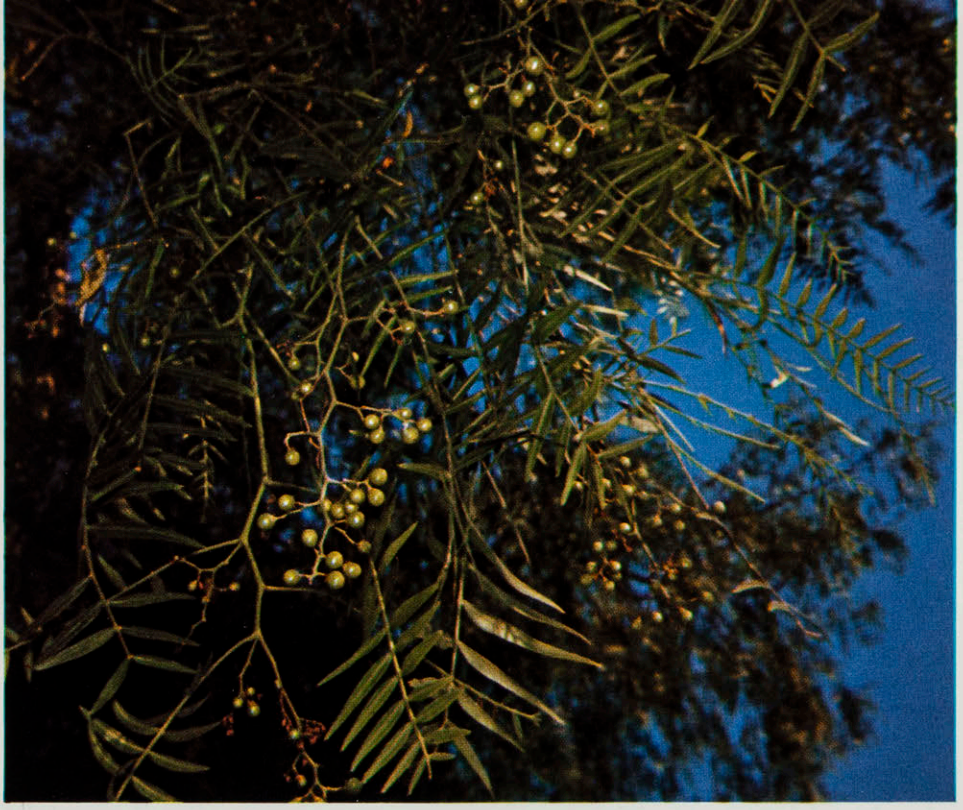
While the fruit is eaten as a delicacy, the tree has been used medicinally for centuries. Chief among constituents of the bark are punico-tannic acid and the alkaloid, pelletierine, which is efficacious in ridding the body of tapeworm. Dioscorides mentions this peculiarity in his herbal. The Ancients used both the leaves and seeds as astringent medicines while the flowers yielded a red dye.

The seeds are demulcent and are thus consumed to relieve an upset stomach. The fruit itself serves as a refrigerant and mild astringent in fevers, while the rind is used in combination with opium to combat chronic dysentery in parts of India. In the incipient stages of sore throat it is a soothing gargle, and in vaginal inflammation, an anodyne for leucorrhea.

Although the castor-bean, *Ricinus communis,* seldom attains arboreal proportions under cultivation, it may achieve a height of 40 feet in tropical regions. Its appearance and habit are exceedingly variable. This plant is native to India where it has several Sanskrit names, but it is cultivated on practically every continent in the world. The large palmate leaves vary in color from deep green to a bronzy purple. Dark red pistillate flowers are borne on the upper part of the inflorescence while the staminate counterparts are below, comprised of a mass of white stamens. *Ricinus* is from the Latin meaning dogtick because of the appearance of its seeds; *communis* from the Latin meaning common.

Prickly, grooved capsules containing shiny mottled seeds of gray, black, brown and white are the source of castor oil — a potent laxative with a most disagreeable taste. Herodotus in the 4th century BC writes about the plant under the name of "Kiki." He mentions the importance of the oil to the Egyptians who used it for burning in lamps and in making unguents. Seeds have been discovered in their tombs. In the 1st century AD, Pliny and Dioscorides mention the plant's strong emetic properties. However, it does not appear that *Ricinus* was employed medicinally until the Middle Ages where it was widely cultivated in Europe. During the 18th century the seeds and oil were extensively imported from Jamaica, thereby diminishing the production of castor bean in the Old World.

Castor oil is obtained from the seeds by two methods of extraction — expres-



Schinus molle —
Cashew family

sion or decoction, the former yielding the best results. The processes involved are lengthy but the end result is a pale yellow to transparent, viscid liquid with a mild odor and acrid taste. In addition to the oil the seed also contains an extremely toxic albumin, ricin, the ingestion of which results in severe poisoning or occasionally death.

Castor oil has been employed in making soap, usually recommended for medicinal use. In the Canary Islands, nursing mothers increase lactation by rubbing their breasts with fresh leaves. Since the oil has solvent properties, akaloids such as cocaine and atropine are dissolved in it and the ensuing solution is utilized in opthalmic surgery.

Black locust or false-acacia, *Robinia pseudoacacia,* is a valuable timber tree endemic to Eastern North America. It was introduced into Europe where it is frequently encountered as an attractive ornamental. In the wild the tree may attain a height of 80 feet. Deciduous compound leaves often hide the long pendulous masses of white pea-shaped flowers which exude a heavy fragrance. *Robinia* was named after Jean and Vespasien Robin, herbalists to the king of France in the 16th and 17th centuries; *pseudoacacia* is from the Greek designating false-acacia.

The wood is highly esteemed by lumber merchants around the world because it seems to harden with age. Thus its use in the construction of ships and other sea-faring vessels is extensive. The inner bark contains an extremely toxic protein, robin, which induces a strong cathartic effect upon the intestinal tract. However, it is rarely prescribed as a therapeutic agent. Robin has been shown to cause clotting of red corpuscles in certain animals and the coagulation of casein in milk.

The California pepper or mastic tree, *Schinus molle,* is native to Peru. This graceful plant with its decumbent branches is so prevalent in Southern California that one may be inclined to regard it as part of the native flora. Tresses of tiny greenish-yellow flowers are followed by rose-colored pea-shaped fruits resembling peppercorns — hence the common name. *Schinus* is the Greek name for mastic tree; *molle* is from *Mulle,* the Peruvian name of this plant.

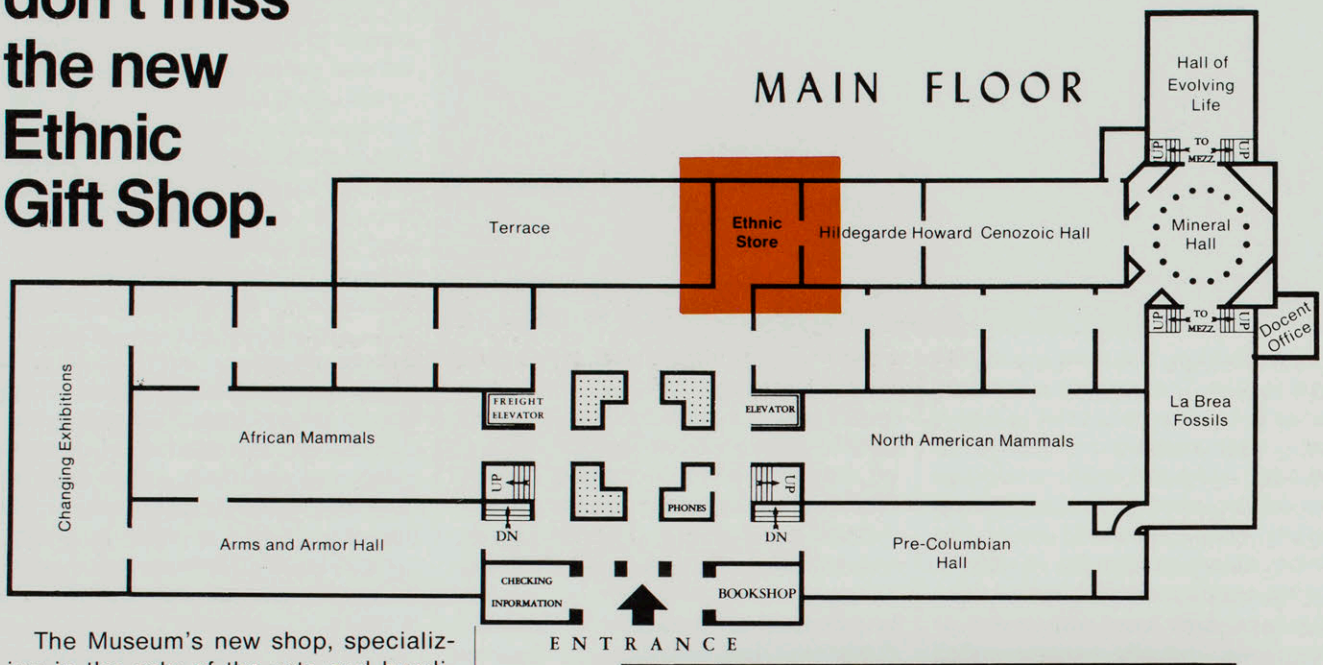
The pepper tree was sacred to the Incas and their predecessors, and was regarded as the most important medicinal because of its salubrious properties. Flatulence, abdominal pain and upset stomachs were treated with a brew made from a decoction of the bark; the berries when mixed with honey and vinegar yielded a soothing tonic. An infusion of crushed leaves steeped into a nourishing tea served as a general panacea. The white resinous exudate was used externally as a poultice for swelling and abscesses. In Mexico, the Indians call *Schinus* by the name of *Piru,* using the resin-like gum as a laxative. An extract from the leaves and fruit has been utilized in the treatment of urogenital ailments as well as in pulmonary inflammation. The resin has also been used to harden gums and to sweeten breath.

The mastic of commerce is obtained from a related tree, *Pistachia lenticus. Schinus* is the source of American mastic, an oleoresin, which is classed as a pharmaceutical necessity. While the pepper tree is still important to various Indian tribes as folk medicine, its use in present day pharmacology is limited.

Southern California abounds with curious and colorful trees, many possessing curative or narcotic properties. Some of the most common have colorful pasts imbued with the medical lore of antiquity. Perhaps there are yet untold medicinal uses for these arborescent denizens which serve as shady adornments for our city streets.

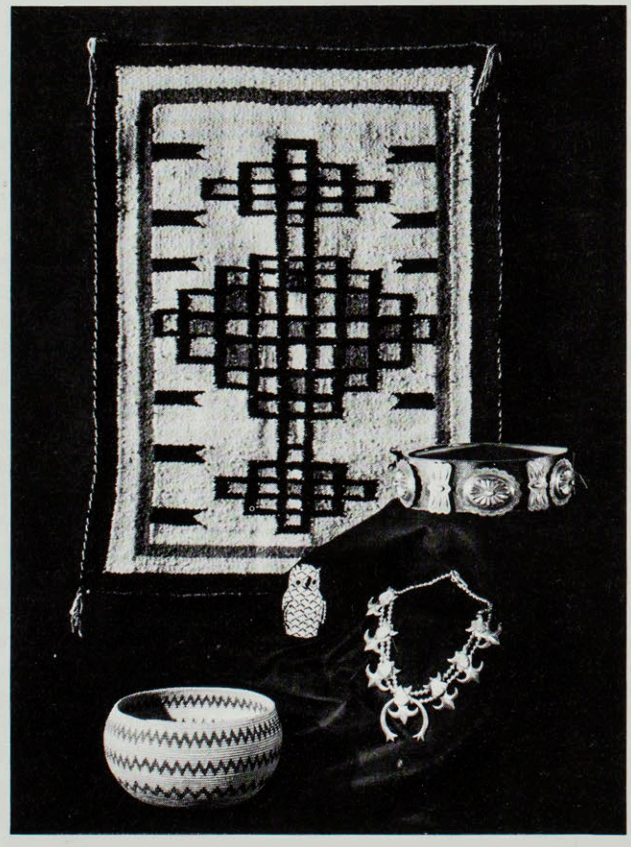
Robert Gustafson, Curatorial Assistant of Botany at the Natural History Museum, began working at the Museum in 1962 as a student worker while attending UCLA. His main interest is working with and photographing flora of the south western United States.

On your next visit to the Natural History Museum, don't miss the new Ethnic Gift Shop.



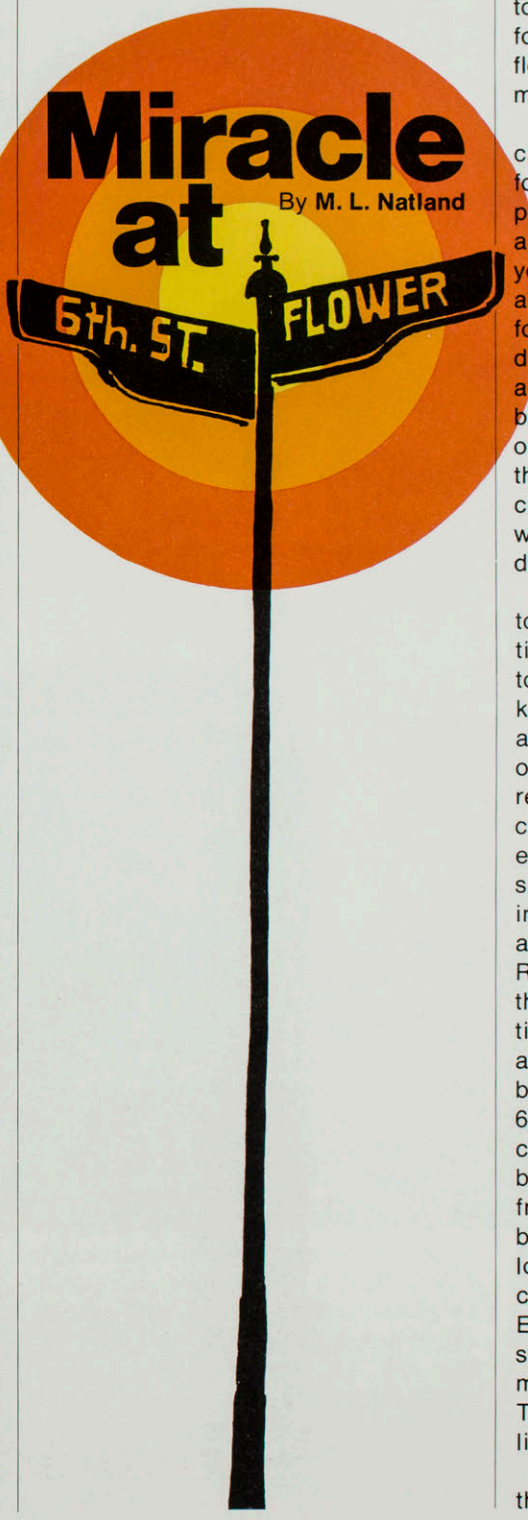
The Museum's new shop, specializing in the sale of the arts and handicrafts of the Americas . . . selected with the care for authenticity, aesthetics and enduring value you expect from a Museum.

Highlights of the New World collection include a brilliant selection of Navajo textiles ranging from saddle blankets to rugs; Navajo, Zuni and Hopi Silver Concho Belts, necklaces, pins, bracelets and rings; plus fine examples of Indian basketry and kachina dolls.



Miracle at 6th. ST. FLOWER

By M. L. Natland



So you don't believe in miracles. You may change your mind when you learn of the following chain of events which preserved the wonderfully beautiful and geologically significant fossiliferous bed exposed during the excavation of the Atlantic Richfield Plaza basement at 6th and Flower Streets in Los Angeles, California (Figs. 1, 2 & 3).

The first in the miraculous chain of events began about five million years ago (Late Pliocene) when the Los Angeles basin was a big inland embayment of the Pacific Ocean. The shoreline at that time was in the vicinity of Los Feliz Boulevard, about four miles north of the Atlantic Richfield Plaza (Fig. 4). Along this shoreline was an abandoned estuary of the ancient Los Angeles River, in whose quiet water a great thickness of shells and rock debris accumulated. A similar condition exists today in the Newport Lagoon in Orange County, California, where for many years shells were dredged from its shallow waters, put through a grinder and sold for chicken feed. The Santa Ana River initially carved this lagoonal trench but later moved its course to its present location between Newport and Huntington Beach. At this new entrance to the sea, large amounts of sand were carried onto the beach where south moving longshore currents rapidly deposited the sand spit on which Newport and Balboa are built.

This bit of information is important to our reconstruction of the conditions necessary to produce the large volume of highly fossiliferous sediments needed for the four mile long flow down slope to the Atlantic Richfield Plaza area. A rough calculation of the volume is 1.5 x 10^6 cubic feet, coming from an area about 3,000 feet long by 500 feet wide and one foot thick. These are not unreasonable figures.

The large volume of shells compared to the volume of sediment tells us that the main course of the ancient Los Angeles River was away from its abandoned bed and was dumping its sediment load farther east (Fig. 4).

So now we have set the stage for a large volume subsea sediment slide. Here comes the second major miracle. The epicenter of a number six or seven Richter scale earthquake on the Raymond Hill Fault shook up this estuarian shell deposit, fluidizing it with added water and the sloppy mass flowed down the sea floor in a narrow stream like a large cement truck dumping its load on a ramp. Miraculously, this flow crossed the Atlantic Richfield Plaza area.

Of course, there are other plausible explanations of this event. It's possible that a large volume of shallow water offshore sediments spontaneously liquified because of overloading. Another bet is that there may have been a large submarine canyon in the vicinity which filled with shelly sediments and periodically disgorged its volume onto the sea floor. This type of activity is known to occur frequently off southern California. Whatever method produced the flow, the Atlantic Richfield Plaza basement was the final beneficiary.

The third miracle is that this geologically very young (5 million years old) fossil bed became solidified to the point where fabrication of table tops and other accessories is possible. As you may know, most typical marbles are not this young but as a rule were formed at least 60 million years ago, during Mesozoic time or older. The ancient marbles may have originally been full of shells but deep burial and other environmental conditions caused these shells to dissolve. Later, these carbonates recrystallized into marble with only shadowy, if any, fossil figures discernable.

Several methods have been put forth to explain this type of rapid solidification. Of these, the following seems best to fit the prevailing conditions. First we know that the shells in the slide originally lived in shallow warm water (75° F or 24° C), or better yet, in a lagoon with restricted circulation where carbonate concentration is higher. The foraminiferal fauna (microscopic, calcareous shelled protozoans) is very abundant in the mudstone immediately above and below the fossil bed at the Atlantic Richfield site. The species making up this fauna have lived on to the present time and are in sea bottom sediment at a depth of 2,000 feet where the bottom temperature is about 42° F or 6° C. Also, when the sliding material came to rest it was quickly blanketed by a layer of silt and clay settling out from the overlying water column. This blanket prevented mixing of the cold low carbonate water with the high carbonate water in the slide material. Eventually the temperature lowered sufficiently in the shell deposit to permit calcium carbonate crystallization. The end product was a hard marble-like mass with shells in good condition.

The fourth miracle developed during the filling, uplifting and erosion of this

Figure 1.

Figure 2.

Figure 4.

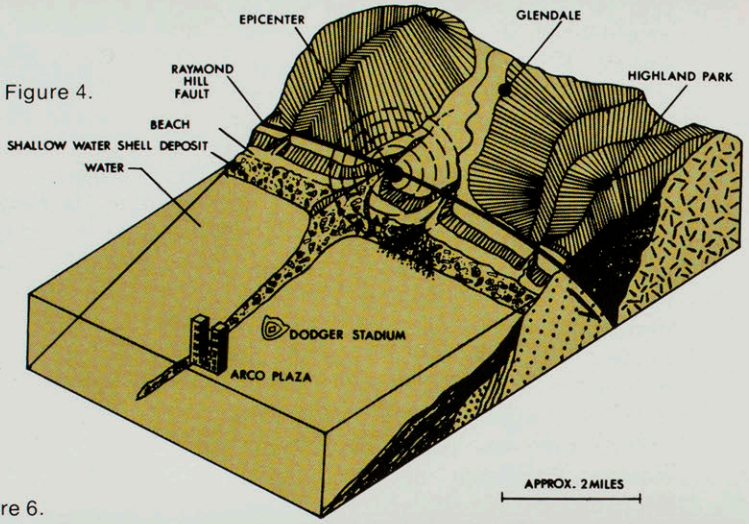


Figure 6.

Figure 5.

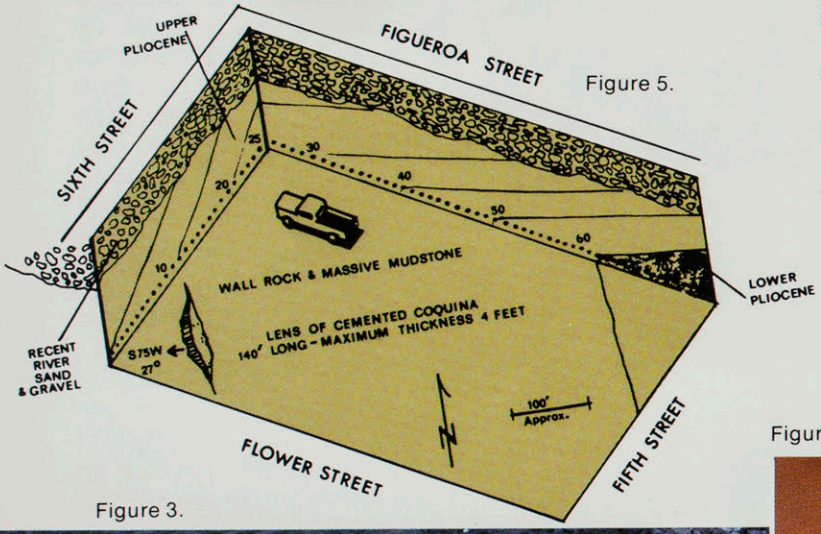


Figure 3.

Figure 1. Atlantic Richfield Plaza, fossilstone bed is sixty feet vertically below circle.

Figure 2. View of fossilstone bed underlying concrete and steel of Richfield Building.

Figure 3. Fossilstone exposure in Atlantic Richfield Plaza basement.

Figure 4. Physical conditions which produced the subsea coquina flow to the Atlantic Richfield Plaza area.

Figure 5. Diagrammatic sketch showing location of fossilstone bed and mudstone samples with foraminiferal fauna. Top of Repettian (Lower Pliocene) occurs at sample 63.

Figure 6. Cube of fossilstone cut from bore hole cobble.

part of the basin. After the submarine slide took place the basin continued to fill until it reached nearly to its present level. About 3 million years ago (beginning of the Pleistocene) the southern California area was beset with major structural changes. During this time the central part of the Los Angeles basin was slowly sinking because of added depositional weight while the northern margin, from Westwood to Yorba Linda, was rising. The uplifting in the area north of the Plaza area caused nearly all of the subsea slide material to be eroded away. Miraculously, the only remaining part of the flow was preserved in the 6th and Flower corner of the Atlantic Richfield Plaza. The right and left sides of the narrow flow did not extend to Flower and 6th Street basement walls (Fig. 5). How far the flow extends toward the Mobil building is unknown. The down dip thinning rate suggests that it might not have gone farther than to a point vertically below the center of the Sixth and Flower intersection. It would be rather expensive to mine out this remaining part.

The fifth miracle happened in 1954, when Clif Johnson, a Richfield Oil Corporation geologist, was sidewalk superintending a drilling program testing foundation soil conditions for the annex which was to be added to the main building. The drill brought up a football sized rock full of shells. Fortunately Clif brought it to my office on the fourth floor of the main building. We concluded, because of its shape, that it was an isolated cobble in the grey mudstone and not part of a larger shell bed. I sent the rock down to the Long Beach Paleolaboratory to be cut with their diamond saw. When the sawed cube was returned I was amazed to see such a beautiful array of colorful cross-sectioned shells in a very fine grey sand matrix (Fig. 6). Fortuitously a coral was sectioned and displayed delicately structured internal parts. Many whorls of cross-sectioned marine snails (gastropods) were half filled with sediments which were once in a very liquid state. In this condition the sedimentary fluid in response to gravity had settled to the low side of the whorl leaving the upper part open. This fluid, with the passage of time, solidified in this position, thus permanently marking the up side and down side attitude of the fossil bed. These rare markings are called geopedals.

This paleontologic kaleidoscope sat on my office desk for sixteen years and was an unending conversation piece of great interest to everyone who saw it. For more than twenty years I have been sampling basement excavations in downtown Los Angeles hoping to eventually piece together a complete section from Pleistocene to Miocene. In the vicinity of the Atlantic Richfield Plaza the first section was sampled in 1953. The Superior Oil Company building (now California Bank building) basement contained an all mudstone section with no molluscan beds. The Crocker-Citizens basement excavated at 6th and Grand Avenues contained several thin lenticular molluscan beds from which Los Angeles County Museum scientists collected a large fauna. Foraminifera from this basement clearly marked the top of the Upper Pliocene at a point about twenty feet from the 6th and Grand corner of the bank building. Here *Uvigerina peregrina* and *Epistominella pacifica* first appear. The ecology of these species indicate a marine water depth of 900 feet at the time of deposition. The molluscan fauna here is also displaced from much shallower water. The basement sediments dip 25° westerly.

The next section sampled was from the excavation for the California Bank underground parking area. This section was all mudstone with no molluscan zones. The Tishman Building basement on Flower Street contained several thin sandy fossiliferous beds not sufficiently cemented to be of value.

Then came the real block buster operation during which the dearly beloved architectural gem known as the Richfield Building was to be torn down. This magnificent edifice was built between 1927 and 1929 during the last days of wine and roses before the great market crash. When I first heard about the planned demise of the building I was considerably saddened even though it meant exposing a part of the next block for continuously extending my fossil sampling deeper into the Pliocene section. However, when I learned that all the buildings in the entire block were to be removed and the basement floor was to be nearly 100 feet below sidewalk level my gloom disappeared, being wafted aside by the thought of completely sampling the section exposed from the 6th and Flower corner to the 5th and Figueroa corner of the basement. During the next few months I checked the progress of the basement excavation. Finally on December 5, 1969 I received permission from Mr. Rollin Eckis, Vice chairman of the Atlantic Richfield Board (now retired) to enter the Atlantic Richfield Plaza basement to collect my mudstone samples. On January 2, 1970, Ahsan Akmal, project safety coordinator escorted me down the long truck ramp to the basement bottom where he turned me loose to "do my thing."

The Cleveland Wrecking Company whose job it was to completely remove the Richfield Building, was busy blasting the lowest part of the foundation. This operation prevented me from beginning my sampling at the highest part of the section at the corner of 6th and Flower Streets so I busied myself sampling the exposed part of the Flower Street wall. When the blasting stopped at 4:30 p.m. I approached the basement area and saw to my great surprise a thick fossiliferous bed. Then it hit me — this is the bed from which the small block came seventeen years ago. After studying the bed for a few minutes and observing large blocks of fossilstone in tumbled array (some weighing seven tons), it occurred to me that this rock could be valuable and should be saved. Then I said to myself, "Natland, you know nothing about the rock business . . . you don't even know that the small block drilled from this ledge was representative of the entire bed." So after inspecting the mudstone exposed in the 6th Street wall I walked up the long truck ramp and near the top I looked back at the stockpile of huge rhomboid boulders and after some reflection I decided that this stuff could be valuable both scientifically and commercially and that it should be preserved at least long enough for further evaluation.

So, I walked down the long ramp and found the D & M Company grading superintendent who told me that the rock was going to the garbage dump because it could not be used for freeway fill. I realized that this was going to cost D & M Grading money so I offered to provide them with a free dumping area where the hauling distance was shorter. He was delighted with the offer and the next morning hauling began.

My eldest son, Jim, and I formed a partnership called Natland Associates to handle the project. Jim took over the responsibility of removing all the fossilstone from the basement. Then, after favorable sawing and polishing results were obtained at a company in Pico

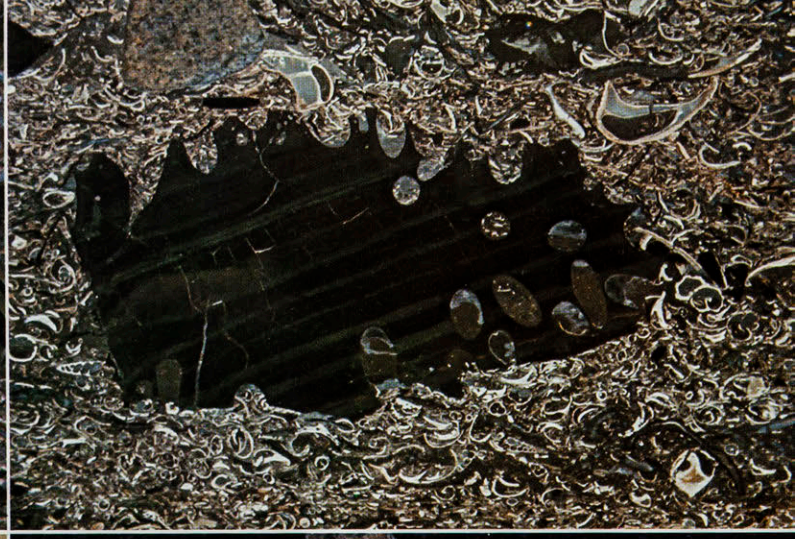


Figure 7. Close up view of polished slab showing cross sectioned molluscan fauna.

Figure 8. Recent pholad boring in hard siliceous middle Miocene shale.

Figure 9. Fossilstone with pholads protruding from their burrows in middle Miocene shale.

Figure 10. Cross sectioned block shows large Middle Miocene block with numerous pholad borings.

Figure 12. Carnivorous gastropods, *Cancellaria tritonidea* (right) and *Polinices reclusianus* (left) locked in mortal struggle at time of subsea slide.

Figure 11. *Upper row:* showing carnivorous gastropod boring a hole in a herbivorous gastropod. *Middle row:* (right to left) growth series of six *Polinices reclusianus* and two *Conus californicus* all with "death holes" bored in same relative spot on each shell. *Lower row: Barbarofusus arnoldi* also with "death holes" bored in same relative spot.

Rivera, California we decided that the best place to have this large volume of processing done was in Italy, a country with centuries of experience in working marble. In 1970 and 1971, 500 tons of selected large blocks were shipped to Italy.

The first shipment of finished products arrived from Italy on June 21, 1971. The shipment consisted of 218 table tops, 20 x 20 inches and 20 x 30 inches. You can imagine my concern when I opened the first of seven large boxes which together weighed 9,500 pounds. Running through my mind was the fear that the few preliminary successful cuts were not representative of all the blocks. With the pulling of each nail my fear began to soar. Had I made a colossal financial blunder because of inadequate testing?

You can imagine my great estasy when I pulled out plate after plate and found that all 218 came through in wonderful condition and their beauty exceeded my fondest expectations. I felt like a man who had just found a bag full of beautifully cut large diamonds. It was certainly the sixth miracle.

The key to this whole project was the small cube cut from the borehole sample seventeen years ago. Lacking this, I am quite sure that, like everyone else, I would not have realized its value.

The esthetic interest in the polished plates is exceeded only by the scientific knowledge extractable from these cross sectioned molluscan graveyards. In Figure 7, the large sectioned shell is *Crepidula princeps* which is extinct. The onyx-like interior filling can be made into jewelry. The small tightly spiraled forms are *Turritella cooperi* and the small, fatter, thin walled spiral forms near the bottom of the picture are *Nassarius perpinguis*. The two latter species are still living and range back in time only to the middle Pliocene. Another common form is *Pecten hemphilli*, a fan-like scallop which usually shows up as bluish-black fingerlike fragments. Small corals are occasionally seen and are usually about one-half inch in diameter, exhibiting an internal radial pattern.

The total number of species found by Museum scientists is about 350. Hence, if one became sufficiently skilled he could identify most of the 350 species from cross-sectioned fragments on the plates. Pholad bored Miocene shale is very common. Pholads are molluscan bivalves which can bore granite although they prefer hard shale. Dr. John E. Warme tells me that the only thing a pholad has to bore with is patience. He enters a small natural hole in a rock when he is small and begins incessant movement of his burr-like base which gradually wears a hole deeper and larger as the shell grows. Since the hole enlarges downward, the opening at the surface is too small for the animal to escape the burrow. He is constantly digging his own grave. Food is obtained by extending a tube through the small exterior opening. Nutrients from sucked in sea water provide his food. I forgot to ask Dr. Warme about the pholad's sex life. How does he manage locked in his rocky tomb?

Figure 8 shows a living pholad recently found in a beach rock. This cobble is made of hard siliceous Miocene shale, the same kind as often seen cross-sectioned on the plates. Note the downward enlargement of the hole and the horny burr at the base of the shell.

Figure 9 shows fossilstone with a bored Miocene cobble. The pholads that made the borings can be seen sticking out of their holes, bored five million years ago. Figure 10 shows a large block of Miocene shale extensively bored around the edge by pholads. Figure 11 shows a carnivorous *Cancellaria* in the act of boring a hole through the shell of a *Polinices reclusianus*. He does this with his drill called a radula. When the hole is complete he snips off the meat and fishes it out from inside. On this same figure, the second row shows a growth series of *Polinices reclusianus* with two *Conus californica* on the left end. In the lower row are six *Barbarofusus arnoldi*. Note that all of the shells are drilled in the same relative position on each species. I have it from good authority that the reason why this drill spot is selected is that the gonads of the bored animal lie beneath these drilled areas. From this, one must conclude that these lowly animals display considerable intelligence by selecting for food that part of the anatomy which contains the most nutrients. How they learned this information and passed it on to their offspring is fascinating to contemplate.

The living *Polinices reclusianus* are all bored in the same spot as their identical six million year old Atlantic Richfield Plaza basement predecessors. Figure 12 shows large *Polinices reclusianus* and a *Cancellaria tritonidea* which were locked in a mortal struggle just before the great earthquake shook them and their surrounding sediment into a liquid mass which flowed down the sea bottom slope to the Atlantic Richfield Plaza area. Apparently they remained locked together throughout the entire four mile travel distance. These locked specimens were released from a very large fossilstone block by one hefty blow with a twelve pound sledge hammer. Truly, the miracles attending this episode are endless.

Such fossilstone articles as table tops, book ends, pen sets, ash trays, bowls, etc. can be purchased through the Bookstore at the Natural History Museum of Los Angeles County.

Dr. M. L. Natland, noted geologist, was Senior Research Scientist for Atlantic-Richfield until his retirement. Of course Dr. Natland, as you can tell from his article, will never really retire. A prolific writer, this is his first TERRA contribution.

by **William Mason**

In 1942 in an atmosphere of growing hysteria, some 100,000 Japanese and Japanese-Americans were removed from their West Coast homes by the United States government. Fearful of sabotage, suspicious of an "enemy race," often envious of their thrift and industry, much of the population of Oregon, Washington, and California supported this forced evacuation. Hindsight now shows that the fears were groundless, that they arose in large part from the constant Yellow-Peril propaganda of West Coast newspapers. Citizen and alien alike, the Japanese were placed behind barbed wire in Oregon, California, and Washington, but not in Hawaii, where they constituted about 40% of the population. Paradoxically, there were no acts of sabotage in Hawaii, where the military was led to believe such acts were imminent. Some argue that the Japanese were interned for their own protection, yet it is remarkable that the federal government placed the victims in jail, and not the few who actually threatened aggressive acts against them.

Manzanar was the first relocation center constructed to accommodate the Japanese. One of ten such installations scattered about the nation west of the Mississippi River, Manzanar was located in the Owens Valley between the Inyo County towns of Independence and Lone Pine in the shadow of the High Sierras. It was a temporary home for 10,000 people and for more than two years was the largest "town" in Inyo County. It was also the camp closest to Los Angeles, which had the highest pre-war Japanese population of any city in the United States.

Manzanar has recently been suggested as a National Monument by the State legislator from Inyo County. The photographs shown here are of the early months in the life of an American concentration camp.

William Mason is Associate Curator of Southern California History and Archives at the Natural History Museum. His research into the minorities of Southern California has made him a recognized authority in the field. He is currently a Consultant in Asian Studies at L.A. State College, Dominguez Hills.

MANZANAR

First Months of a Concentration Camp

Different parts of the city were evacuated on different dates; this was one of the early groups taken from their homes in the southwest part of the city. The assembly point here is on Twenty-third Street just east of Vermont Avenue.

Evacuees were to store their belongings except for those which could be carried in a suitcase. Too often the goods were vandalized or spoiled during the time the owners were absent. Ernest Fukuda, a Water and Power employee living on West 30th Street, is readying his family's possessions for storage.

Though a few went in their own cars, a fleet of busses marked "special" scooped up the evacuees and took them to a provisional camp at Santa Anita.

"Weapons" and short-wave radios taken from evacuee homes. Policeman Joseph Aigner is holding a Japanese saw, scythe, and kitchen knife in his hand. The knives stabbed into the box were used to slice vegetables, not people.

Santa Anita grounds in April of 1942, filled with small prefabricated houses for the Japanese evacuees. Though cramped and uncomfortable, nothing better was made available until permanent camps were built in isolated parts of the West.

The stables were also remodeled to accommodate evacuees. Those who were housed here were not so fortunate as those in the prefabricated buildings, because of the lingering odor of horses, especially on hot summer days. Another unpleasant aspect of Santa Anita life was the manufacture of camouflage netting, a dusty and difficult task.

A woman says goodbye to her husband as he goes on ahead to Manzanar to help get the camp ready for the 10,000 people who were to occupy it. About 1,000 persons went ahead of the others as a volunteer work force.

After the bus leaves with her husband, the same woman is seen crying for a time. Perhaps it was the first time she had been separated from her husband since their marriage.

Most of the evacuees were sent from Santa Anita to Manzanar in the summer of 1942, although some went in May. This group is waiting at the Los Angeles bus depot at Sixth and Los Angeles Streets for bus transport to the new camp.

Some of the first evacuees who went to Manzanar left by train. Here Paul Nagata stands beside the baggage waiting for his parents nearby. The massive moving of people and the general anxieties of the adults made many children uneasy.

Yukiko Okinaga is interrupted from eating an apple by two or three photographers' flashbulbs. She, too, seems somewhat worried.

Arrival at Manzanar by train at night. MP's were at the freight station to greet the volunteers. The elderly man leaving the train reflects some uncertainty about the evacuation.

One of the sights that first morning at Manzanar was the MP camp and the evacuees' guards. The soldiers are armed with shotguns and bayonets, although few, if any, of the interned Japanese and Japanese-Americans were determined to escape or behave violently when they first arrived. But within a few months there was trouble, when a Manzanar civilian employee stole sugar to sell on the blackmarket and several other incidents occurred. During the disturbance guards fired at the crowd, killing two young Japanese-American men.

The new arrivals soon discovered that the camp was far from finished. Most of it was still under construction when they arrived, and there was plenty of work for everyone.

Three older men moving into their new quarters discover that it is still under construction and lacks the finishing touches.

The first meals were prepared under difficult circumstances in an unfinished galley. The stove pipe is just being installed while the cooks are trying to use the stoves.

These young ladies are cleaning up the finished barracks by getting rid of the scrap lumber. The girl at the left is doing her share despite her high-heeled handicap. Later such scrap lumber was prized by the evacuees for building shelves, furniture, partitions, and other necessities.

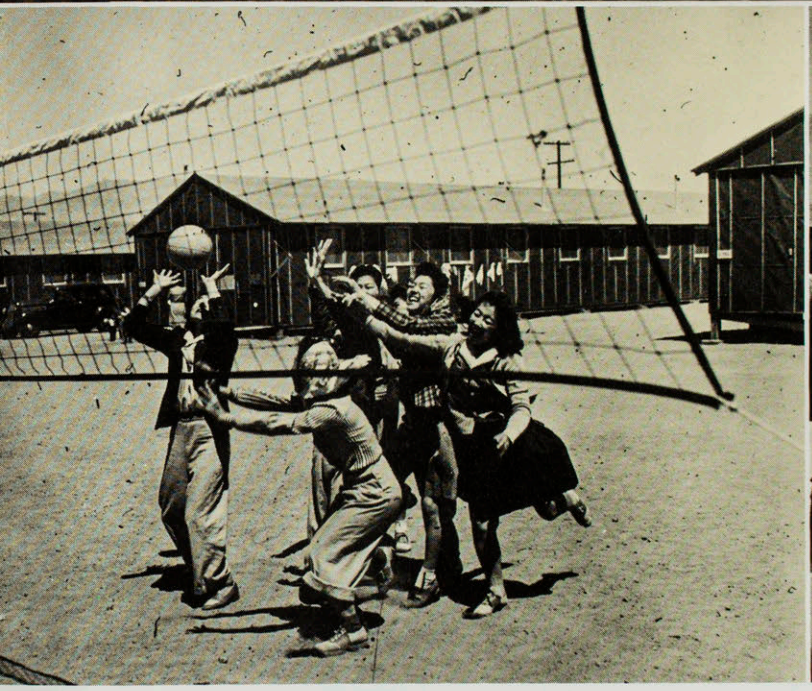
The camp began to take shape as early as June, 1942. Here is an early street scene, probably in the vicinity of Block Two. Mount Williamson is the background.

Almost immediately a newspaper was started. The *Manzanar Free Press,* like its forerunner the *Santa Anita Pacemaker,* was a mimeographed paper, usually eight pages long. Two of the pages were in Japanese, the rest in English. This is a view of the composing room.

Two young people of Manzanar, Michiye Mori and George Akahoshi, examine a Montgomery Ward catalogue for clothing and other necessities. Evacuees were allotted a monthly clothing allowance of $4.00 per person.

Mr. and Mrs. Howard Kumagai, among the early Manzanar residents, are shown here doing their laundry. There were many recently-married couples in the camps, so many that sociologists were prompted to study the situation. They found that many young lovers, prompted by the uncertainty of their futures, married in the spring of 1942. Although husband and wife had much time together, Manzanar was hardly the place for a honeymoon. Barracks life made it almost impossible to find any privacy.

At night the young people found some time for recreation. A piano was truly a treasure, even if inexpertly played. The girl holding her ears appears to be critical of the piano player.



These young people, still in their work clothes, are perhaps trying to recapture the mood of more festive occasions in happier times. Despite the hardships, and the enormous injustice of evacuation in the first place, young people were characteristically optimistic and hardworking, capable of enjoying themselves when time permitted.

The enthusiasm and spirit of the *Nisei* youngsters is evident in this photo. A game of volleyball is a welcome diversion for these girls.

The *Issei*, or Japan-born oldsters, had their moments of satisfaction, too. They were able to grow guayule plants from mere seedlings into mature plants in a fraction of the time estimated by the government. They did so by caring for the plants in a nursery where each plant received much attention and intensive work. The product of their work was the production of synthetic rubber, badly needed by the U.S. during World War II. It is ironic that these men worked so hard for a country which would not permit them to become citizens.

One outlet for much of Manzarnar's population was baseball. Enjoyed by young and old alike, it was one of the events which helped to relieve the boredom of incarceration. This was the great problem for many people who were accustomed to working hard and who had often been self-employed. There was not enough to do, and time went slowly. In that respect, Manzanar was like any other concentration camp.

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